

The 'Heart Gap' Will Cause Soul-Ache

By Joshua Lederberg

THIS YEAR'S news is and will continue to be full of the trial runs of new medical machines which are a turning point in the joining of medicine and technology. For several years, the artificial kidney has been a technical success, but a soul-ache for many whose lives might be sustained if this scarce and costly mechanical substitute were in their reach.

The artificial heart is now moving inevitably to a level of practical utility. No matter how discouraging the early trials of recent weeks, we must think of the policies needed to cope with the eventual success of this machine.

At first thought, such an advance appears to be an unmitigated blessing, but power does not come to man without matching responsibilities. This applies especially to a power for life and death. As is often the case, the worst perplexity comes from a technological imbalance. At this point it appears likely that machinery that could save lives of at least 100,000 Amer-

Science and Man

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His column will appear weekly in this section.



icans a year could be perfected by 1970. But we will then face several cruel dilemmas during what might be called the "heart gap."

The first few machines, by

the mere postponement of a personal doom, will be miraculous blessings—but only for a few. It is certain that within our present framework of political decision, confusion about automation, and technical organization, the machines and the clinical skills needed to apply them will be pathetically scarce for several years thereafter.

But how to choose the few who should receive the benefit may not be the worst dilemma. It is equally certain that, while the early versions of the artificial heart might prolong life, they will also keep alive many cardiac cripples, persons irrevocably tied to their machines. And the worst stage of the gap will be the period when on a large scale the machines saves life but not livelihood, when a "plastic heart," rather like an iron lung, becomes the fount from which the patient cannot long depart. Such a gap could well last 10 or more years, say from 1970 to 1980, at an economic cost on the order of \$100 billion.

It has been suggested that plastic hearts not be used until they give livelihood as

well as life. The suggestion flies in the face of human nature as well as medical ethics, especially where there is substantial hope of future improvement if the patient can only be sustained a few years longer.

THIS PROBLEM and its possible remedies are part of many larger issues of human and social responsibility. Reason and compassion join in mobilizing every useful economic resource that can fend death. On this argument, medical machines—substitutes for failing human organs—will become our predominant industry.

Medicine already takes a growing part of our gross national product. Increasingly expensive opportunities for treatment will soon be available because sophisticated technology has been brought to bear on medical problems. Our arms budget is high for quite comparable reasons—we feel we cannot afford not to invest several millions of dollars each for an advanced aircraft or missile, but only because that costly technology has made it available.

The human issues, like the shift in age composition and its impact on family life, are no less perplexing; so are the implications for world order of ever more poignant demonstrations of the use of wealth. Our column cannot even list all of these concerns, but the public arousal and private conscience that are the root energy of democracy must start somewhere.

Should we not have begun yesterday to start thinking of human biology as one of the main sectors of political responsibility?